ERIC Document Resume	See Instruction Sheet	DATE OF RESUME 7/6/68	DATE RECEIVED

A. PUBLICATION DATA

1. ERIC NUMBER	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.	DO NOT WRITE IN SPACE BELOW
ED000903	8496		

4. AUTHOR(S):
N.A.

5. TITLE OF DOCUMENT ABSTRACTED:
The Administrations of Federally Sponsored University Research: Papers Presented at the Conference on Administration of Federally Sponsored University Research

6. PUBLICATION TITLE:
N.A.

7. EDITOR(S):
N.A.

8. PLACE OF ORIGIN
ORG. SREB
ST. 130 Sixth St., NW
CITY, STATE Atlanta, Ga.
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE
Southern Regional Education Board

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	63	43

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TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL X
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR
conference

16. INDEXING TERMS (8-12)
conferences R-32
administrations R-06
research P-37
government S-02

17. ABSTRACT (MAX. 250 WORDS)

Collection of six conference papers which discuss the administration of research within the university and the Federal-university relations within the research field. The following papers were presented: "Some Problems and Issues in Sponsored Research," by Fred R. Gagle; "The Carnegie Study of the Federal Government and Higher Education," by Reuben H. Gross; "University Research Administration," by Daniel O. Price; "Colleges and Universities in Federal Programs," by J. Kenneth Little; "Strains Between Government and Universities in Research and Mitigating Factors," by Charles V. Kidd; "Summary of the Atlanta Conference on Administration of Federally Sponsored Research," by John K. Folger.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION	20. DIVISION OR DEPT.	21. CONTRACT NO. / PROJECT NO.
	22. TOTAL COST OF PROJECT	
	23. DURATION OF PROJECT	U.S. Department of Health, Education, and Welfare Office of Education

ERIC Form 1

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Educatio

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R-7-19

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The Administration of Federally Sponsored University Research

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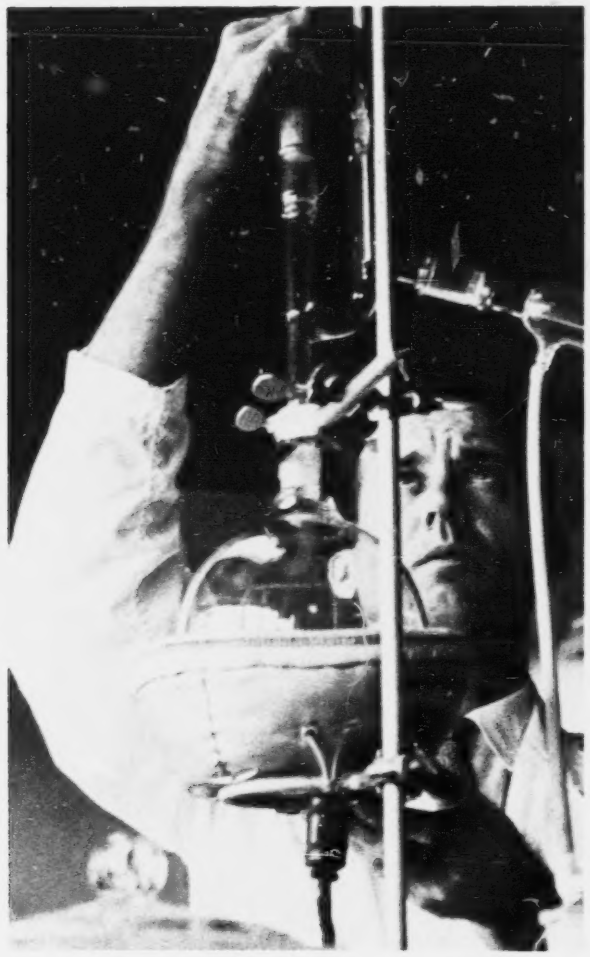
ED000903

SOUTHERN REGIONAL EDUCATION BOARD

The Administration of Federally Sponsored University Research

PAPERS PRESENTED AT THE CONFERENCE ON ADMINISTRATION OF
FEDERALLY SPONSORED UNIVERSITY RESEARCH
HILTON INN, ATLANTA, GEORGIA
APRIL 29 - MAY 1, 1962



THE SOUTHERN REGIONAL EDUCATION BOARD
130 SIXTH STREET, N. W.
ATLANTA, GEORGIA
1963

Preface

In September 1961, Harvard University issued a small pamphlet in which was reported a study of the impact upon that university of $18 million in Federal programs at Harvard. The three danger points to which it calls particular attention are largely matters of research administration, broadly defined—first, a threat to the balance among the several fields of learning; second, a threat to the balance between teaching and research; and, third, a threat to the balance within the faculty between those with and without tenure appointments. One hesitates to draw close parallels between Harvard and anybody else, but it may well be that the problems of research administration in the universities of the South parallel those of Harvard University.

In any event, I am confident that the persons who have contributed the following papers are people who well understand what these problems are and that their ideas on what can be done to cope with them demand the earnest attention of policy-makers, both in the universities and in government. Certainly the importance of maintaining the balance between research and the university's other responsibilities is borne in upon us when we note that while instructional expenditures have risen by 6 or 7 times in 20 years, university research expenditures have multiplied 30 times.

The larger theme of the Atlanta Conference on Administration of Federally Sponsored University Research—Federal-university relations—is one that has received a growing amount of attention in recent years. Various facets of the relationship between the Federal government and universities have been studied by people who took part in this conference. Charles Kidd of the National Institutes of Health made an important study of the nature and scope of the problem, which was published in 1959 under the title, *American Universities and Federal Research*. Mr. Kidd described in such lucid terms the nature of the change which is occurring in Federal-university relations that I will take the liberty of using some of his words to state one of the underlying premises of the conference at which these papers were presented:

> Large scale federal financing of research has set in motion irreversible forces that are affecting the nature of

> universities, altering their capacity to teach, changing their financial status, modifying the character of parts of the federal administrative structure, establishing new political relations, and changing the way research is organized. I believe that the wisdom with which these forces are guided and controlled by the universities and by the federal government will have a major influence not only on the capacity of this nation to defend itself, but on the economic growth of the nation and the preservation of the essential values that underlie our society.

Other participants in the Atlanta Conference on Administration of Federally Sponsored University Research have made important studies of university research administration and of Federal-university relations. J. Kenneth Little of the University of Wisconsin, at the request of the U. S. Commissioner of Education, recently conducted an intensive survey of Federal programs in higher education. Reuben Gross directed the Carnegie Study of Federal Government and Higher Education.

The matter of Federally sponsored research has been a long-time interest of the Southern Regional Education Board. In part, this stems from the fact that in the late 1940's Federal agencies made relatively few research contracts with universities in the South. The earliest serious proposal that the Board should facilitate research contracting between Southern universities and government agencies arose in September, 1950, from the increased activity of these agencies during the Korean War. In October, the Commission on the Development of Graduate Studies and the Executive Committee of the Board endorsed proposals that the Board help graduate and professional schools to "undertake broader programs of contract research," and recommended that it establish "adequate administrative machinery."

A Committee on Defense Programs was then appointed, with C. Clement French of the Agricultural and Mechanical College of Texas as chairman. The committee visited Washington and interviewed a number of representatives of Federal agencies. In March, 1951, the Board published a description of defense research programs in several agencies, with procedures for making contact with each. Late in March, 1951, the Board assembled, largely at its own expense, two subregional meetings (at Atlanta and Memphis) of institutional representatives at which agency representatives explained the kinds of contract

research interesting to them. A total of 259 representatives of institutions were present.

A small office was set up by the Board in Washington in February, 1951. The staff member in charge spent alternate weeks in Atlanta and Washington. Administrators and faculty members of Southern institutions seeking agency support for research called upon this office for information about procedures of application and names of agencies and personnel likely to be interested in a specific project. The Washington office was also consulted by agency administrators seeking information about Southern universities. It was maintained until May, 1952, when it was closed in accordance with the original intent of the Board to assist in making the first contacts between interested Southern universities and the agencies and to leave further work of this description to the parties directly concerned.

Several years ago the Southern Regional Education Board became concerned specifically about the problems of university research administration. Through its Carnegie supported program of research in higher education, the Board sponsored two studies of university research administration. Daniel O. Price of the Institute for Research in Social Science at the University of North Carolina studied the administration of research programs *within* a large number of universities; and Fred R. Cagle, Coordinator of Research at Tulane University, studied relationships *between* universities and the Federal government in the area of research. Reports of both of these studies have been released by the Board. Papers by both Price and Cagle are contained in the present report.

The Southern Regional Education Board called the Atlanta Conference because it was thought that there had been sufficient study of the administration of university research to make it possible to define many of the problems and suggest some alternative courses of action. A major purpose in convening the conference was to give to those who are most concerned with these problems—university administrators—an opportunity to discuss them among themselves and with those who have made extended studies in this field. The papers which were presented are now published in order to make possible a further extension of such discussion and perhaps to contribute to the solution of problems arising fr[illegible] the government-university relationship. I regret that it is not possible to include the stimulating

presentation of Chancellor H. H. Ransom of the University of Texas on "Relations Between Universities and Federal Government in the Field of Research—From the Point of View of the University."

WINFRED L. GODWIN, Director
Southern Regional Education Board
Atlanta, Georgia

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SOME PROBLEMS AND ISSUES IN SPONSORED RESEARCH

FRED R. CAGLE
Research Coordinator
Tulane University

Edward R. Murrow tells a story about a cub reporter. This young cub reporter was sent to cover his first big story—the Johnstown flood. The editors in the city room were impatiently awaiting his cabled report and holding open the presses. As they eagerly awaited the news, they received their first statement from the young reporter. It read, "Nothing can be learned. All is chaos."

After talking to people about the problems of government-university relations for several years, I was tempted to terminate further activities by NOT writing a report and simply indicating, "Nothing can be learned. All is chaos."

The phrases "relation of the Federal government to higher education" or "the partnership of the Federal government and universities" are misleading—misleading because we cannot sufficiently identify the partners and their activities.

If the needs of government agencies matched the total responsibilities of the university, few problems would be created by government-sponsored research. But the needs of government agencies, identified by the willingness of Congress to provide funds, represent only some components of the total *national* needs that must be met by universities and represent only small segments of the research in science that the nation requires.

Congress has provided substantial funds for research in science and technology, the training of personnel in some professions, as well as token funds for a miscellany of purposes. As a result of Congressional action, more than 40 branches of the Federal government need the help of universities. Yet 97 per cent of the research funds are obligated by the Departments of Health, Education and Welfare and of Defense, the National Science Foundation, the Atomic Energy Commission and the National Aeronautics and Space Administration. *But no branch of the Federal government is concerned with the total university.* The major needs identified by Congress are for new

knowledge essential to the solution of problems in medicine, weapons development, space exploration, atomic energy, and agriculture. Too, Congress has, somewhat hesitantly, granted that "basic science" must be supported.

As science and technology bring new innovations, more research is needed. The increased complexity of the industrial network requires new approaches and new devices; as society becomes more complex, only advanced systems and techniques can keep it functioning effectively. We will necessarily see more science, more technological innovations.

The university must play an increasing role and only the Federal government can make that role possible. But the universities themselves—not government, a complex of government agencies, or a group of scientific societies—should identify and establish that role. Actions have not been taken to do this.

Too, the universities must assume the responsibility of persuading the government to abandon the simple exploitative use of science. Government does not support science for its own sake but for the sake of "practical ends" which a legislator can identify. This is in contrast with the orientation of the university. In our time, government must be persuaded to identify the actual significance of science and technology and to support them accordingly—not in fragments merely contributing to short term ends. The university should accept the need for this change and act to gain it.

Our nation has no national science policy. Only the university can provide the intellectual leadership to gain such a policy.

Government agencies are far more complex than implied by the number of branches utilizing the universities. The elaborate organization of some agencies has resulted in many discrete divisions—and each may implement differently the established policies and procedures. The extreme complexity of government and its relations with universities is suggested by the apparent frustration of the House Education and Labor Committee. This committee, unable with all its power to gain a logical picture, initiated its own comprehensive survey of Federal aid to education. The problems encountered by the staff of the Senate Committee on Government Operations in the preparation of the report "Coordination of Federal Agencies' Programs in Biomedical Research and Other Scientific Areas" likewise illustrate this complexity.

There is no single voice of government for either higher education or science. Few profitable results can come now from discussions of the relation of the Federal government to higher education. But significant, useful results can come from discussion of the relation of *each* agency to the university.

The diversity of government activities has brought increased confusion and complexity to the campus.

A faculty member's comprehension of the research picture is keyed to how his discipline has been financed by the Federal government. Often the subject matter divisions of an agency implement the same policy in different ways. The mathematician assumes that the NSF has a very generous policy of salary support; the biologist, that NSF does not have a generous policy of salary support. The engineer will speak favorably of DOD contracts; the physician will object to DOD contracts.

The NIH is a dominant factor in the university having a medical school; the Department of Agriculture an influence in the university oriented toward agriculture; the NSF in the institution stressing neither agriculture nor medicine. The AEC influences the institution having strong departments in the physical sciences; the DOD and NASA are major forces in technological institutions and schools of engineering. And the reactions of a university president or dean in a discussion of Federal government-university relationships are usually related to the policies of the agencies with which he has been dealing. He thinks of these agencies as reflecting government policy.

The federal agencies working with the universities present a discordant chorus of opinion to Congress; the universities also offer a multitude of opinions.

And so Congress finds it politically feasible to support only the obvious needs—medical research, defense research, saline water conversion, or coal research.

The Federal government is not organized to support the university; the Federal government is organized to support mission-oriented research. The university is not organized to administer government funds for research, to identify its research administration problems, to exert leadership in the formulation of national policy.

What are some of the major issues in sponsored research that should concern the universities?

The nation's need for research in science and technology will increase rapidly. How can the universities contribute adequately

to this need without distortion of their total programs and without losing their role of leadership in science and technology? The universities are losing this leadership! Tokens of this are the tendencies of government to turn to non-university associated groups to perform analytical tasks. Thus the NASA turned to the Brookings Institution to estimate the implications of space activities for human affairs and to the RAND Corporation for an interpretation of Communist China's strategy in the nuclear era.

The nation has a need for research in the humanities and the social sciences. But this need will probably not be recognized by Congress. How can the universities provide equal opportunities for creative scholars in all fields?

The greatly increased availability of Federal funds for science and technology can slowly convert universities to institutions dominated by science and technology. If this is not desirable, how can it be prevented?

The continuing operation of the project system makes excessive routine demands on the leading members of the faculty. One university faculty writes more than 1,700 proposals each year. How can the university reduce such use of faculty time?

The advisory system of government demands the time and talents of many distinguished members of the university faculty. How can the university reduce this drain on faculty time, while establishing other channels to gain information and influence?

If the universities are to influence government policies so as to gain a real partnership with government, the universities must have a precise and current knowledge of agency and Congressional actions. How can the university gain such knowledge?

The continuing growth of the projects system for support of research will result in the advancement of universities gaining 50 per cent or more of their annual expenditures from the Federal government. If this dependence is not desirable, how can the universities avoid it? How can the university exercise self-restraint in the acceptance of research funds?

The university must assume full responsibility for the proper expenditure of government funds. How can it do this while providing sufficient budget flexibility to the investigator and reducing his administrative load?

Federal research funds are removing the best teachers (both faculty and as graduate students) from teaching. Must not the university find a way to correct this?

The rapid increase of research budgets in some university departments has converted scientists to *entrepreneurs.* Increased provision of research funds for the humanities and social scientists will create a similar situation in these fields. How can the university better insure that the talents of scholars are devoted to teaching and research? Is there a procedure for identifying suitable limits to the research programs of a department?

Scholars in those fields not supported by government or by foundations are becoming second-class members of the academic community. How can the university correct this?

These sample issues are but a dim reflection of a multitude of others. Few of these can be satisfactorily resolved until educators have sophisticated knowledge of the present roles of higher education and the Federal government—perhaps not until a real partnership is established between higher education and government, and a national policy for science and higher education is established.

But first the machinery for interaction must be improved. Coordination of the government's activities in science involving higher education is essential. The formation of an Office of Science and Technology as a unit within the Executive Office of the President may be helpful. The director of this office assists the President in three areas of interest to universities:

1) Formulating major policies, plans, and programs of science and technology of the various agencies of the Federal government, giving appropriate emphasis to the relationship of science and technology to national security and foreign policy, and to measures for furthering science and technology in the nation.

2) Reviewing, integrating and coordinating major Federal activities in science and technology, giving due consideration to the effects of such activities on non-Federal resources and institutions.

3) Assuring that good and close relations exist with the nation's scientific and engineering communities so as to further in every appropriate way their participation in the strengthening of science and technology in the United States and the free world.

The recent reorganization of the Office of Education may provide an additional coordinating influence in government.

And the American Council on Education may attain the role of representative for higher education. One of its first

efforts must be in semantics; government support of research must *not* be identified as "Federal aid." Rather it must be recognized as university aid to the Federal government.

We may hopefully asume that these three organizations will provide an improved forum for discussion of needs, for debate of issues, and for effective representation of the viewpoint of higher education and of government. Perhaps we will have a procedure for talking to government.

The need for early decisions by the universities is *urgent.* The agencies are moving rapidly. The NIH is reorganizing; the NSF is seeking new policies; the DOD and the AEC expect to double their research programs in ten years. The NASA expects a five-fold expansion by 1970. Additional branches of government are moving to support research. The Department of Commerce recently provided $400,000 to a college for a science program.

Congress is with one hand administering a severe reprimand to some agencies for poor administration of Federal funds and with the other providing vast additional funds for science. Tomorrow Congress will be identifying *poor use of Federal funds by the universities.*

Each university should decide, in the context of long-range plans, how it can contribute to the nation's need for information and how it must organize for the task. Each institution should then judge government programs in terms of its plan. Out of such planning and reorganization will develop the identification of programs, policies, and procedures that higher education should make politically feasible.

Another need is for improved communication between the major elements involved in decision-making about research programs—the university, the science organizations, the Federal agencies, and Congress.

The lack of effective communication is exemplified by recent statements of a spokesman for higher education and a spokesman for Congress.

President Gaylord P. Harnwell of the University of Pennsylvania (*Higher Education and National affairs:* Bull. 11, No. 10, March 8, 1962) presented the need for payment of the full cost of overhead. Congressman Fogarty (*Congressional Record,* March 27, 1962, pp. 4733 and 4734) explained that Congress should not pay the full cost.

What are the basic differences in their statements?

Harnwell: The NIH should pay the *full* cost of research; the university cannot subsidize government-sponsored research.

Fogarty: The NIH should not pay the *full* cost of research; the university should subsidize government-sponsored research.

Why this basic difference?

1. Congressman Fogarty tends to equate the programs of NIH with medical schools; President Harnwell speaks of universities.
2. Congressman Fogarty in effect states that if acceptance of the grants injures the institutions, why do they continue to accept an increasing volume of dollars from the government? President Harnwell speaks of the obligation of the university to encourage research but emphasizes that university subsidization of overhead will cause universities to restrict the amount of research funds they accept from the NIH.
3. Congressman Fogarty thinks of the NIH grant program as a subsidization of university programs. President Harnwell thinks of the university as providing a service to the government.

The current tendency of Congress to restrict overhead rates rather than to permit the payment of the audited rates suggests the continuing lack of understanding.

Improved communication will require increased staff in universities and in the professional organizations representing American universities.

The university can solve the problem of continued expansion of research to the detriment of the teaching function only if one of these alternatives is feasible.

1. Rewards for teaching—personal satisfaction, prestige, salary—can be made equal or superior to those for research.
2. The university can devise a workable system that will maintain faculty morale and a wholesome attitude toward teaching while *restricting* the total energies, money and time devoted to research.
3. The universities can isolate the graduate school from the undergraduate school or create associated research institutes—while substantially increasing the rewards for teaching.

None of these alternatives appears feasible today. The university must thus "do the best it can." And in order to "do the best it can" with research funds pouring into the back entrance for individual faculty members, the university must have the policy, procedure and staff to achieve the following:

a. Current knowledge of the total influence of project funds on the university.
b. Analysis and approval of each proposal for project support in terms of the university's planning.
c. Approval of each project on the basis of a full analysis of the impact of that project on the institution.
d. The privilege of either stimulating the development of some new projects or the inhibiting of others without serious influence on faculty morale.

The challenge is for the universities. They must identify the problems created by such government programs as project research, decide what actions are essential, insure proper advice and guidance to government, and work to make the required actions politically feasible.

THE CARNEGIE STUDY OF THE FEDERAL GOVERNMENT AND HIGHER EDUCATION

REUBEN H. GROSS, DIRECTOR
Study of the Federal Government and Higher Education

The Carnegie Foundation for the Advancement of Teaching is sponsoring a Study of the Federal Government and Higher Education. Several self-studies have been made as part of this study, and research administration by institutions of higher education is one of the subjects covered in the self-studies.

The Carnegie Study was undertaken because of a growing awareness that a new and relatively unmeasured dimension is being created in higher education. The phenomenal increase in the availability of Federal funds is affecting its traditional purposes—instruction, research, public service and the guardianship of national standards and values. Moreover, colleges and universities as organic entities are affected.

Encouraged by the positive response to a speech by John W. Gardner, President of the Carnegie Corporation and The Carnegie Foundation for the Advancement of Teaching, to the American Council on Education in October 1959, the Corporation staff began exploratory discussions. Leaders in both the government and higher education were consulted throughout the early months of 1960 as to the type of study needed. The meeting of The American Assembly in May 1960 on the subject of The Federal Government and Higher Education served to crystallize plans. The decision was made to set up a policy-oriented, cooperative study centered on the experiences of a limited number of institutions.

Twenty-three institutions were requested to complete, at their own expense, self-studies of the impact of Federal programs on them. The president or chancellor of each accepted the invitation and appointed a coordinator for the self-study of his campus. Since four campuses of the University of California made separate self-studies, 26 campuses are represented.

The diversity which exists throughout higher education made the selection of institutions a complex and delicate task. The decision was taken to include only institutions offering at least a four-year program leading to a non-specialized first degree.

Nevertheless, no reasonably short list could be representative; much less could it be comprehensive. An effort was made to select a cross section of public, private and church-related institutions whose experience or lack of experience with Federal programs illustrates their effects on the vitality of higher education.

The Study is concerned with the effects, on institutions, of federal relationships as illustrated by the experiences during the 1959-60 academic year of the cooperating institutions. Their chief executive offices submitted data concerning these experiences and discussed and interpreted the advantages gained and the tensions created. Both the qualitative and quantitative sections of these reports have been analyzed. Suggestions for maximizing the benefits and minimizing the strains have been examined.

While never unconcerned about higher education, the government has, since World War II, become increasingly dependent upon it for the accomplishment of vital national needs and objectives. In responding to these and other national demands, higher education has become increasingly dependent upon the government. There can be no turning back—only a reorientation of the mutual relationships which have emerged so that, in serving the national interest, each party more effectively protects and strengthens its own individual interests and those of the other party.

The notion of reciprocal interests between the government and higher education, however elastic one must be in defining them, makes sense. Federal agencies need research for the conduct of their missions. Institutions need Federal support for conducting that portion of this research which they can best and most cheaply perform and for the very costly facilities which its performance requires. Congress has approved such programs of research support, including the funding of facilities at institutions. Here is a reciprocal interest of national importance. This academic research, predominantly of a fundamental character, is the keystone of the country's effort to advance in applied research—in which science departments of universities have also been called upon to help—and in technological development.

The advancement of knowledge in fields related to the missions of government agencies is a national interest in the furtherance of which research programs at institutions of higher

education have been supported. These programs have required both facilities for the conduct of research and the assurance of a continuous flow of scientists. Congress has appropriated considerable sums of money to agencies for the support of research programs, including training and facilities, in certain segments of some universities, specifically those whose academic environment has attracted and retained as faculty members scientists of proved or promising excellence.

The discussion so far illustrates the impossibility of applying static principles to what is inherently a dynamic situation. To insure the success of scientific research programs, training opportunities and facilities had to be supported. Similarly, the national interest required that more Americans be trained to fulfill the international obligations, public and private, of a world power. The scientific and international needs of the nation have led to a concentration of Federal programs at the graduate level, but their continuing success has required support of undergraduate education and training. In other words, national interests cut across the academic spectrum in many areas and at different levels.

Because such is the case, the first section of the guidelines used by the cooperating institutions represents an effort to analyze statistically the impact, on the entire institution, of Federal programs in the academic year 1959-60. We asked each institution to consider that "the camera should be stopped" as of that time. Since grants and contracts supporting the research of individual members of the faculty in scientific departments had started the cameras moving in the years after World War II and since this type of support still represents the largest single stimulus to the flow of Federal money to the campus proper, the information on research programs provided by the self-studies is more complete than is that on other categories of programs. The 26 institutions spent a total of $130.4 million Federal funds in 1959-60 for departmental research. This total represents 28.0 per cent of all government money spent at educational institutions in support of research and development. For the purpose of analysis, we have divided the institutions into 4 groups. Group A includes the 12 universities which spent more than $5 million; Group B, the 6 which spent between $1.5 and $2.75 million; Group C, the 4 which spent between $140,000 and $870,000; and Group D, the 4 colleges which spent either very little or no Federal research money.

While these figures are interesting by themselves, they take on more relevance when considered in relationship to total operating expenditures for educational and general purposes. We have charted both sets of figures—Federal departmental research support funds expended in 1959-60 and operating expenses for educational and general purposes in the same year —for the cooperating institutions. The composite charting of the financial implications of Federal research programs does permit at least one significant conclusion. Federal funds expended for these programs at large institutions represented a greater proportion of total operating expenditures for educational and general purposes as the total of such funds increased. *Government research support programs appear to be helping to make the big institutions bigger.* One corollary to this conclusion is that Federal agencies are heeding the advice of the President's Science Advisory Committee to "aim at sustaining and re-enforcing outstanding work wherever it may be found." A second corollary is that institutions in serving the national interest are thereby becoming significantly dependent on one type of extramural support. In the process, they are, as reported in the qualitative part of their self-studies, also able to become stronger as high caliber scientists are attracted and held by these Federally supported programs.

The cooperating institutions were very clear in asserting that Federal research programs have supported research activities that would not have otherwise been possible. Even a precursory glance at the self-studies suffices to dramatize the salutary effects of Federal research support. The range of benefits cited is wide, extending from general comments that research has been increased greatly and that graduate programs have been instituted, extended, diversified and enriched, to more specific remarks relating to financial benefits to graduate students and to the procurement of otherwise unobtainable equipment and supplies.

Yet because Federal funds are spent by agencies for purposes relating to their missions, tensions have developed on the campus. These strains are inevitable in view of the lack of congruence between the aims of the sponsoring agencies and those of institutions. The institution is an organic entity which operates on the basis of autonomously determined, ever-changing balances. The infusion of large sums of money to support projects in particular departments for specific purposes does not

necessarily disrupt these balances. However, the failure of Federal programs to provide full cost reimbursement means that institutions accepting these programs must be prepared to divert institutional funds in support of them. Several institutions showed a real concern that they may lose control over the direction of their overall effort as a result of having to supplement projects sponsored by the Federal government.

While this and some of the other difficulties cited in the self-studies can be handled by institutions individually, there was general agreement that The American Council on Education should be supported in its efforts to become an effective organization for communication with the government. The Council must also encourage institutions to take the initiative needed to resolve present problems and to keep the course of government-higher education relationships on a mutually productive path.

One can then be optimistic about the future, and our Study indicates a guarded optimism. Educational leaders must recognize that more than muddling through is necessary in the 1960's. They have the responsibility of insuring that free and autonomous institutions strongly needed in the national interest continue to prosper.

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UNIVERSITY RESEARCH ADMINISTRATION

DANIEL O. PRICE, DIRECTOR
Institute for Research in Social Science
University of North Carolina

I would like to begin by emphasizing the relative unawareness on the part of many university administrators of the impact which research projects are having on the pattern of development of their universities. To a very large extent, the shape or pattern which a university will have 10 or 15 years from now is being determined right now by the research projects and grants being accepted. Many university administrators see as their major responsibility the administration of their state or institutional funds, and these are the funds which provide the basis of support for the institution. However, the main support for new programs and growth in the university is the research money that frequently comes in through the side door without much surveillance on the part of the university administrators. These growth funds should be given as careful surveillance as the funds for basic support of the institution.

In the publication *University Research Administration Policies* I have pointed out two extreme positions regarding overhead, neither of which is satisfactory. I have suggested that a more balanced program of research and development will probably take place if the university tends in the direction of undertaking only research into which it is willing to put some of its own money. The basic reason for this suggestion lies in the fact that, if the university thinks it must put some of its own money in the research, more careful consideration will be given to the place of this particular program in the total development of the university. This careful consideration is frequently not given to programs that, on the surface, "cost the university nothing."

It is important to realize that this surveillance of research funds, most of which are from the Federal government, is not just negative. The idea of a detailed master plan is hardly acceptable for university development, but is important to have some long-range goals which can provide criteria for consideration of incoming funds. Given such long-range goals, it is frequently possible to find sources of funds that can be used to

help shape a university into the desired pattern, and it is frequently possible to use already existing funds in a more effective fashion. For example, I know a medical school that is trying to recruit and hire a sociologist, but the sociology department of the university concerned is not officially aware of this. Given proper administrative guidance, it is reasonable that in many cases such a sociologist could be brought in as a joint appointment between the health sciences field and the academic department with the result of strengthening both areas. Most Federal agencies do not object if a person hired on a research project teaches one course a semester without reimbursement from the department. Such a joint appointment arrangement frequently makes it possible to recruit a better person and thus strengthen the research project at the same time the department is strengthened through being in a position to offer an additional course. If the university is willing to reduce teaching loads for the purpose of conducting research, it is entirely reasonable that there should also be a policy for the reduction of research loads for teaching.

This example not only points out the way in which research funds can be used to help a university meet long-range goals, but also points out the importance of good working relationships between the professional schools and academic departments. The most likely areas of competing research programs are between academic departments and the professional schools, particularly those professional schools related to the health fields because of the large amount of Federal funds available to them. University policy should encourage and even insist upon joint consideration of relevant research projects in order that joint strength rather than competition can be developed.

Another major area of needed university policy in relation to research programs is in the area of reimbursement of faculty members. Everyone who has studied the problem recommends that faculty salaries not be supplemented from research funds, especially when the supplement is contingent upon the continuation of research funds. The policy of permitting salary supplements from research funds often causes faculty members to develop research projects in areas that can be financed in such a way that their salaries can be supplemented rather than develop research in those areas which are most important or in which their main capability lies. Such a policy frequently leads to a faculty member becoming a research *entrepreneur* and

using the university as a base of operations rather than viewing it as an institution to which he owes his primary loyalties. Research *entrepreneurs* should not be suppressed, but their energies and abilities should be used in aiding universities to reach long-term goals rather than in developing small empires of their own that may be quite tangential to the purposes of the university.

Obviously some case can be made for salary supplements because many universities permit them. However, most administrators who have had experience with salary supplements seem to feel that resort to supplements is not desirable. When such supplements do exist, policies regarding them should be uniform for all people from the same discipline.

A policy of no salary supplements within the university must be coupled with some sort of policy on outside employment. Such a policy should not concern itself with the amount of outside income but with the time spent—in the type of work. Continuing consulting relationships with government and private agencies are frequently of such a nature that they redound to the professional growth of the faculty member and his university. However, as one engineering school administrator put it, "I don't want my engineers to spend all their outside time designing layouts for sewer lines." Many universities have found that a reasonable policy seems to be an average of one day a week as the amount of time that might be spent on outside employment. When such a rule exists, university administrators should realize that there are times when exceptions should be made to this as well as most other rules, but such exceptions should be made as exceptions—not as precedents.

Also of importance to university administrators are policies that will increase the integration of research and graduate training. Most research projects utilize graduate research assistants and, while all projects should not be required to utilize research assistants, those that do not should be given careful scrutiny. Not only should research projects be designed to utilize graduate students, but their utilization should be in a fashion that will contribute to their graduate training rather than consist of routine work.

The utilization of research associates on research projects to give more time and attention to students is another way in which research projects can contribute to the teaching mission of a university. In order to maximize this possibility, consider-

able attention needs to be given to developing the structure of the university in a way to properly utilize research associates, people who exist in nearly every university as fulltime research workers but who have no real affiliation with academic departments or the teaching mission of the university.

In general, in considering research proposals and research funds, if a research program does not fit into the ongoing purpose of the university and into its long-range development, such research might best be developed outside of the university framework. Many universities have set up fairly independent laboratories such as MIT's Lincoln Laboratories, but research operations that are relatively independent of the total educational process should be set up deliberately and not by the process of unplanned growth. Research funds should be accepted by a university when they help the university accomplish its mission, not because "it doesn't cost us anything."

THE PARTICIPATION OF COLLEGES AND UNIVERSITIES IN FEDERAL PROGRAMS*

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I. *The Educational Scene*

The Needs of the Nation. National educational needs are usually expressed in terms of manpower. Spectacular achievements on many fronts of science and technology are transforming the nature of man's occupational life. Tomorrow's world of work will require a more flexible and mobile labor force, but most of all, it will require people with much higher levels of education and training, both general and technical. The number of occupations that require education and training beyond the high school is steadily growing. The military security and the economic welfare of the nation hinges upon the full educational development of its human resources. The complexity of the problems faced by a nation entrusted with the leadership of the world's freedom loving people spells the necessity of cultivating higher levels of information and understanding among all its citizens.

The Needs of Individuals. The needs of individuals may be expressed in terms of their opportunities for self-realization. Our nation respects the dignity of the individual and the value of his achieving his fullest promise both for his own happiness and for the common good. It wishes to tolerate no artificial barrier between the individual and his opportunity for an education commensurate with his talents, his ambitions, and his efforts. It resists the notion that men are servants of government and that schools are the tools of government. It has confidence that a self-governing, free people will find ways to marshall their full resources of mind and muscle in pursuit of goals which they believe to be valid for all humanity.

The Needs of Institutions of Higher Education. The needs of educational institutions are expressed by the dimensions of the task they face.

*This paper consists of excerpts from a report to the U. S. Commissioner of Education, following a Survey of Federal Programs in Higher Education.

A basic condition affecting the quality of institutions of higher education now and in the immediate future is rapid growth. The nature and rate of this growth is suggested by the following facts.

Growth in Student Enrollments. Despite a 60 per cent increase in the number of full-time students attending colleges and universities during the 1950's, the number will double between 1960 and 1970. This relentless increase is fed not only by a population increase, but by a rising level of educational attainment in successive generations, changes in occupational patterns resulting from the expanding economy and technology, and by a prospect that the future will require greater technical and specialized knowledge of all citizens.

Growth in Research Activity. Between 1930 and 1960 expenditures for research and development in colleges and universities increased 5.5 times as rapidly as did their total expenditures. In fact, many major universities, whether by design or drift, are becoming centers of graduate education and research —concentrating upon theoretical studies, preparation for the professions, and the conduct of research and research training at the doctorate and post-doctorate levels. Attention to the programs and objectives of undergraduate education in these institutions seems to be lessening.

These growing dimensions of basic research and graduate education are posing problems of finance which overreach the resources available to the states and the resources upon which privately-sponsored universities depend.

Growing Participation in International Affairs. American colleges and universities are annually receiving an increasing number of students from other countries. A growing number of institutions of higher education are undertaking educational commitments in other countries. This new dimension of service brings with it not only new demands upon the academic staffs of institutions of higher education, but fresh considerations of the adequacy of instructional programs, counselling services, and general competence for widening horizons of service and responsibility.

Government and education are interdependent. Both are instruments to fulfill the aspirations of our people. It is crucial, therefore, that our people have clear and steady perception of the swift-moving events which are currently welding government activity to higher education for the promotion of national

security and welfare. There is need to insure that educational institutions are able to respond to new and urgent national needs. There is need also that they be able to resist forces and currents which would divert them from their basic purpose—the education of the free citizen.

II. *The Federal Programs*

The following topic sentences present in capsule form some of the implications of Federally sponsored programs in colleges and universities.

The analysis of the Federally sponsored programs in which colleges and universities of the United States participate leads to the following central observations:

Colleges and universities are a prime resource for the accomplishment of the missions of Federal departments and agencies. Most Federal departments and agencies make some use of institutions of higher education. The total activity spells a close identification of the institutions' services with the accomplishments of national objectives and a growing interdependence between Federal agencies and departments and the institutions that participate in their programs.

The Federal government has had three central purposes in its programs involving higher education.

(a) To take full advantage of the nation's present resources of specialized personnel, knowledge and research capacity for the accomplishment of specific national objectives.
(b) To strengthen and expend these resources as needed for the accomplishment of specific national objectives.
(c) To encourage and assist larger numbers of American youth to continue their education to levels which are consistent with their individual potential; especially, to increase the number and improve the quality of the nation's supply of persons with high level technical, scientific, engineering and other professional training.

The following list illustrates the major activities for which the Federal government uses the resources of colleges and universities:

(a) The operation of government-owned research laboratories or centers.
(b) The performance of basic research.
(c) The provision of specialized education and training programs.

(d) The operation of educational assistance and development programs in cooperation with other countries.
(e) The provision of programs for the in-service training of Federal employees, both civilian and military, in the United States and abroad.
(f) The provision of special educational services for students, faculty members, and visitors from other countries.

The Federal government is a prime source of direct assistance to colleges and universities. Federally sponsored programs provide these major forms of direct assistance to colleges and universities or their students:

(a) Financial assistance to students through loans, fellowships, veterans' benefits, including a limited program of subsistence allowances, and other forms of subvention.
(b) Loans for the construction of housing and other facilities for students.
(c) Loans and grants for the construction of research laboratories or other facilities for specified purposes; and for the purchase of special types of research or instruction equipment.
(d) Grants for the augmenting of research staffs in specified fields.
(e) Institutional grants to be used for the strengthening of specified programs according to needs determined by the institutions.
(f) Appropriations to share with the states the costs of instruction, research and extension services in agriculture and the mechanical arts.

Federal activity in higher education is vast, growing and changing.

Vast and Growing. Federally sponsored programs involve hundreds of millions of dollars, hundreds of thousands of students, thousands of professors, and hundreds of institutions of higher education. As a single item, Federal funds for research and development in the sciences performed by colleges and universities amounted to more than $700 million in 1960. Without counting persons who are attending educational institutions as part of in-service training programs for employees of the Federal government, at least 500,000 students are attending college with Federal financial assistance of some form. Hundreds of faculty members give instruction to students in Federally sponsored institutes and educational programs, on and off the

campus. Hundreds more are rendering counsel and instruction to educational counterparts in many parts of the world. Hundreds of college campuses have structures built with the assistance of Federal funds or given to them outright. Federal programs provide hundreds of thousands of dollars worth of special equipment, research and educational materials to improve research and instructional programs in designated fields.

It is extremely difficult to trace the exact amounts of all Federal funds that are eventually expended in institutions of higher education. The routes are circuitous (sub-contracts, etc.), the records are fragmentary, and the accounting is complex. A minimum estimate of the funds expended in 1960 for the purposes detailed in this report would be 1.5 billion dollars.

In a world of swift moving events, colleges and universities are fighting obsolescence in many parts of their program and arrangements. On fronts deemed to be critical to the immediate national interest, the Federal government has stepped into the battle.

Changing. As Federal programs have multiplied in size and number and more departments and agencies have been involved in their operation, policies and procedures have changed. These major trends are apparent:

(a) Programs that seek to strengthen and support institutional resources are being added to those that "purchase services."

(b) Grants for the improvement of instruction and training in specified fields are supplementing grants for research only.

(c) Grants for post-doctoral studies and for advanced training of professors in specified fields are now offered, whereas financial assistance was available earlier for undergraduates and graduate students only.

(d) Grants to departments or groups of departments are supplementing grants to individual investigators.

(e) Grants to institutions as a whole for self-determined strengthening of their programs in designated fields are supplementing grants to individuals, departments, or groups of departments.

(f) Programs to assist institutions in adding needed new staff members and laboratory facilities are joining programs designed to attract larger numbers of able and ambitious youths to graduate or professional study.

(g) Loans and grants for the construction of classrooms, libraries, and other facilities for academic instruction are being proposed to supplement loans available for construction of housing and other student facilities.
(h) Grants are being used more frequently as the vehicle of support for the programs.
(i) Grants for longer time periods are replacing short-run or yearly agreements where appropriate and possible.

The missions of Federal programs are seldom stated in terms of aiding colleges and universities as such, although the programs in support of activities in land-grant colleges are a close approach. The programs in support of research and related activities in medical schools are similar in effect, and the programs which make loans and grants for buildings and equipment have the effect of general assistance. No Federal program, however, grants funds for unrestricted use by institutions of higher education; and the purposes of Federal programs are usually stated in terms of furthering advances in agriculture, science, health, foreign affairs, providing for the common defense, or giving financial assistance of students rather than in terms of strengthening institutions of higher education.

The relationship of the Federal government to institutions of higher education follows two major patterns, Federal-state and Federal-institutional.

Federal-State Cooperation. In this pattern the Federal government joins with the state in support of educational programs directed toward the achievement of goals deemed to be in the national interest. The Federal government provides continuing appropriations for use in institutions established or designated by the states for the accomplishment of these goals. Allotment of funds to the states is made by formulae. This plan is exemplified in the century-old program operated by the nation's land-grant colleges.

Federal-Institutional Cooperation. This pattern evolved out of practices developed during war periods in which the teaching and research personnel and the facilities of colleges and universities were needed for military or defense-related purposes. Federal agencies and departments acquired these services primarily through contracts with individual institutions. This pattern seeks and rewards excellence and thus tends to concentrate the Federal activity within very strong institutions, just as the

bulk of defense contracts in business and industry tend to be placed in large companies.

The National Defense Education Act. The National Defense Education Act represents the clearest and strongest assertion of the Federal government's concern and interest in the strength of the nation.

Federally-sponsored programs have multiple Federal policies. Each Federal department and agency that has programs in colleges and universities formulates its own policies and procedures and establishes its own relationships with institutions of higher education. Federal departments and agencies report to different committees of Congress and operate under differing legislative and executive directives. There is no mechanism that coordinates the contacts of Federal agencies with colleges and universities.

Federal programs are administered with the advice of the academic community. Federal agencies utilize the services of hundreds of specialists drawn from colleges and universities who serve on advisory panels, selection committees, and in other consultative capacities. Many administrators of Federal programs are former members of faculties of colleges and universities. Thus, representatives of the academic community participate extensively in developing the operating policies and procedures of many Federally sponsored programs.

Federal programs emphasize research and graduate education. The rapid growth in Federally sponsored activity has had strong impetus from advances in science and the urgencies dictating further rapid developments in science and technology. The needs for new knowledge spell needs for trained minds to discover that knowledge. The dissemination of this knowledge and the extension of its benefits to citizens of our country and those of many other countries requires persons with high level training and special experience. In short, the extraordinary contingencies of our age call for extraordinary minds which have had extraordinary education and experience. It is upon developments of this kind that Federally sponsored activity has concentrated. The dominance of these objectives is shown by the fact that between 1955 and 1960 about 75 per cent of all Federal income reported by colleges and universities was for research activities. Since research training is the essence of graduate education, the emphasis upon research engages programs of

higher education at their highest and most expensive levels—doctorate and post-doctorate education.

III. *The Participating Institutions*

The nature of Federal programs determines the number and kind of institutions involved. The major thrust of Federally sponsored activity is toward basic research, graduate education, and the development of an adequate supply of persons with high level scientific, technical and professional, and specialized learning. For these purposes, institutions that offer degrees at the doctorate level are the prime resource.

The number of institutions in the United States that have programs at the doctorate level is comparatively small. Fewer than 10 per cent of the nation's colleges and universities offer degrees at the doctorate level. Thus, the immediate and effective resource for most of the current missions of Federal departments and agencies is restricted to not more than 200 of the nation's more than 2,000 institutions. The prime resource resides in not more than 5 per cent.

Funds for Federally sponsored activity are concentrated within about 100 major institutions. With the exception of some programs of financial assistance to students (e.g., student loans, veterans' educational benefits) more than 83 per cent of the Federal funds for each main type of program are allotted to not more than 100 institutions. In fact, 25 of the 100 institutions receive from more than 50 per cent to more than 66 per cent of the funds in each major type of program with the exception of education and training where the figure is 44 per cent.

The level of institutional participation in Federally sponsored programs is associated with their character and general strength. In general, the extent to which institutions are utilized in Federal programs relates to the following conditions:

(a) Quality and size of staff in fields related to Federal missions.

(b) Level and quality of on-going research activity in pertinent fields.

(c) Level of degree production at the doctorate level.

(d) Ratio of graduate to undergraduate activity.

(e) Presence of schools of agriculture, engineering or medicine.

(f) Nearness to Federally-owned research centers or defense

installations, or to geographical areas favorable to the performance of specific Federal missions.

(g) Strength of financial resources; level of gifts and grants from foundations, industries, individuals and other sources.

Public and privately-sponsored institutions participate about equally. The 100 major participants in Federally sponsored programs, as measured by total Federal income in 1960, include 54 public and 46 privately-sponsored institutions. The division of Federal income between all colleges and universities was 55 per cent to public and 45 per cent to privately-sponsored institutions. (This division includes income for the operation of government-owned research centers.)

The geographic spread of the 100 major participants is uneven. All but seven states have at least one institution which ranked as one of the 100 major participants (in terms of 1960 volume of Federal income for educational and general purposes). Those states are Idaho, Maine, Montana, North Dakota, South Dakota, Nevada and Wyoming. The 25 institutions which received more than 50 per cent of 1960 Federal income reported by all colleges and universities are located in only *15* states.

The location of the major participants coincides with the location of the nation's centers of strength in graduate education. The major centers of greatest strength include:

(a) The strong privately-sponsored institutions clustered in the New England and Mid-Atlantic states.

(b) The group of large state-supported institutions in the Midwestern states.

(c) A smaller group of strong state and privately-sponsored universities in the Pacific states.

The Mid-Atlantic group includes one state university (Pennsylvania State); the Midwestern group includes one privately-sponsored university (University of Chicago). The Southeast is represented by Duke University; the Southwest by the University of Texas. The Deep South, the Plains states, and the Rocky Mountain states are not represented.

The development of greater strength in more universities in more places is a part of the nation's unfinished business. Strong faculties in strong colleges and universities are the true safeguard of the integrity and independence of our system of higher education.

IV. *Effects of Federal Programs*

Viewpoints about Federally sponsored programs in higher education are kaleidoscopic. In general, the opinions are colored by shades of political belief and commitment to various educational values; and they change in shape when turned toward different types of Federal programs. Attitudes toward the question of "Federal aid to higher education" differ from attitudes toward specific programs that support some of the objectives and programs of higher education. Within the academic community, the humanists' views differ from the scientists'; professors' views differ from those of university administrators, heads of undergraduate colleges or deans of graduate schools; participants' appraisal is different from that of nonparticipants; students' opinions differ from those of their teachers; other citizens have attitudes not shared by educators.

Certain common threads of opinion, however, are visible within the fabric of judgment about this vast and complex situation. The consensus seems to be that:

Federally sponsored programs exert a strong influence upon the programs and objectives of institutions of higher education. This influence affects not only the institutions directly participating, but wave effects spread to the total structure of higher education.

Federally sponsored programs have strengthened educational programs and objectives in the areas and fields in which Federal interest has been expressed. The nation's basic research activity and potential have been markedly increased. The quality of graduate education in numerous fields has been enhanced. The excellence of the graduate student body has been increased. New vistas of scientific efforts have been opened. Greater technological achievements, agricultural productivity and medical advance have been achieved.

Federally sponsored activity is welding a growing interdependence between major institutions of higher education and Federal departments and agencies.

Federally sponsored activity is greatly expanding the dimensions of the research function in higher education. Expenditures for organized research, which formerly were minor in comparison, now approximate or exceed expenditures for instruction in many major universities.

Federally sponsored activity extends across a wide band of

the educational programs of institutions that are heavily involved. Studies of Federal programs within individual institutions illuminate the fact that, while individual Federal programs are highly specific, when taken altogether they extend across a great part of the educational program of the institutions that are heavily involved.

Federally sponsored activity and funds are becoming a built-in feature of the function and finance of major universities. Substantial proportions of the total operating budgets of schools of medicine, dentistry, public health, engineering, and divisions or departments in the natural sciences are now derived from Federal funds. Basic scientific investigation at its present level of strength simply would not exist without the stimulation which Federally sponsored programs provide. The effect of sudden withdrawal of Federally sponsored activity would be as traumatic as the sudden withdrawal of Federal contracts or subsidies from many major industries.

Federally sponsored activity is exciting much debate and deliberation. The discussions center around these issues:

Objectives and Purpose. The special interests and missions of Federal programs are not always congruent with the central purpose in higher learning. Hence, college and university faculties and administrators are debating such questions as—to what extent can universities become performers of outside research without being transformed into research institutes? How can the values of liberal education survive in a climate which gives major emphasis to the growth of highly specialized training? How can the integrity and independence of an institution as a whole be maintained while responding to strong stimulation and support of only some of its segments, only pieces of its programs, or only parts of its purpose? To what extent are the objectives and programs of the institution being shaped by extra-institutional decisions? Colleges and universities strongly appeal for the kind of consideration and action, from government and elsewhere, which respects and promotes their basic function, recognizes their diversity, and deals with them as a whole.

Balance. The impact and influence of Federal activity strikes unevenly across the structure, basic functions, and instructional fields of individual institutions and among institutions of different types and strength. The matters

provoking greatest concern center around the differential impact of Federally sponsored activity upon:

(a) Well established universities with strong faculties and high prestige in comparison to young growing institutions with smaller resources that are trying to develop greater strength and prestige.
(b) Institutions that have graduate programs in comparison to institutions that have strictly undergraduate programs.
(c) Research activities and functions in comparison to instructional objectives and functions.
(d) Fields, disciplines, and areas within fields strongly supported in comparison to those not supported, or much less supported.

Administrative Control. From the viewpoint of administrators responsible for the development of the overall program of a department, division, school, college or university, the situation leads toward administrative anarchy. Some of the complaints are:

(a) Faculty members tend to identify with the missions of the Federal agencies more than with the total purposes of their educational institutions.
(b) In a period of short supply and intense competition for strong faculty members, administrators are hard pressed to meet the conditions of released time, space, and facilities which accompany the acceptance of Federally sponsored projects or assignments by their faculty members.
(c) Imbalance in levels of support among fields of study tends toward inequities of treatment among faculty members of equal individual merit and equal contribution to the overall objectives of the college or university.
(d) Undergraduate colleges and undergraduate programs in universities which prize the teaching function find it difficult to attract and retain strong faculty members whose professional recognition and path to advancement depend heavily upon productivity in research.
(e) Growth in the subvention of graduate students through fellowships and research assistantships, coupled with the preference of many professors and students for research-related assignments,

tends to restrict the supply and quality of teaching assistants.

(f) The specialized missions of Federal agencies tend to foster the formation of clusters of staff members whose activities are isolated from the main stream of the institutions' objectives and programs. Sometimes these groups are found in newly created 'centers' or 'institutes'; sometimes they form a special group within an established department that does not enjoy the same status and conditions of employment as other members of the academic staff.

(g) Some Federal missions, as in foreign country assignments, remove faculty members for extended periods at a time when student enrollments are burgeoning.

(h) State-wide and regional boards of higher education that have responsibilities for the orderly planning and development of programs of higher education can find themselves blocked or by-passed by arangements accomplished through direct Federal agency-institutional contracts or grants.

These situations have not been created nor wholly caused by Federally sponsored activity. They simply reflect the types of problems posed to the management of institutions of higher education, at all administrative levels, as the institutions steer their course through swift and swirling streams of influence upon their programs and objectives.

Finance. Institutions of higher education find that it costs money to accept money. While colleges and universities tend to seek contracts and grants with Federal agencies and departments and to participate in the programs established, the relationship in many programs is an uneasy one. Anxieties are expressed about possible lack of continuity of the programs. Complaints are registered about administering Federal programs the full costs of which are not reimbursed. Matching formulae and other eligibility requirements draw general institutional funds toward Federally sponsored programs. Multiple programs administered by multiple agencies with multiple policies and procedures multiply administrative costs.

Freedom. The issue of Federal control over the programs and objectives of higher education seems to be debated more ve-

hemently in citizen groups than in educational circles. Within educational groups there seems to be not much fear of dictation of educational policy or practice, but some irritation or impatience with administrative procedures.

The extent to which research activity becomes siphoned toward Federally-defined missions, graduate studies become shaped to conform to them, and institutional policies and programs become warped to take advantage of them are topics of considerable discussion in some academic circles. There can be no question that there is Federal influence—and a strong influence. The issue is whether institutions of higher learning will permit it to be a controlling influence, and whether the nation's colleges and universities have the courage and character to withstand unwarranted intrusion in the educational domain.

In summary, the verdict of the institutions participating in Federally sponsored programs is that, on balance, the Federal activity has been appropriate, beneficial and constructive—that its deficiencies stem primarily from its piecemeal nature; that most of the difficulties are being overcome by experience; that its dangers lie more in weak policies and standards of participating institutions than in dictatorial tendencies of Federal agencies and departments; that shortages of qualified faculty members loom as the major hazard; and that the basic need is a stronger and wider base of financial support dedicated to strengthening the total purpose and program of institutions—the kind of strength which assures a balanced educational program sustained by faculty committed to standards of excellence and dedicated to the ideals of free inquiry.

STRAINS BETWEEN GOVERNMENT AND UNIVERSITIES IN RESEARCH —AND MITIGATING FACTORS

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The relationship between the government and the universities raises issues of fundamental policy for both parties. Mutual dependence is one of the central aspects of their relationship, not only in research, but totally. The government depends to an unprecedented degree upon the health of the universities. On the other hand, to an increasing degree the universities cannot exist without the government, and particularly without money from government. There is built into this relationship of mutual dependence an array of conflicting interests and attitudes stemming from the fundamental functions of these two institutions—government and universities. These conflicts will continue to be difficult to resolve. The reasons why there are conflicts are fairly numerous.

One of the origins of lack of complete congruity and sympathy between the universities and government is that much of the Federal support of research arose out of wartime experience. This was a high pressure, rather frenzied effort to turn out applied research findings. This kind of high pressure work directed towards applied ends is antithetical, in many respects, to university life, to the mores of the universities. It put the whole relationship between the government and universities on a basis of strain. Such things as security regulations, restricted areas, classification of work, secret theses, and absence of provision for publication were built into the early phases of this relationship between government and universities.

Another source of difficulty that faces universities in dealing with government is the extreme diversity of the Federal administrative structure and a corresponding diversity of rules and regulations. While diversity and flexibility are a necessary consequence of initiative on the part of Federal staffs, there are dangers of confusing and frustrating the recipients of the money. This diversity makes it difficult to settle issues and to arrive at uniform policy.

Another source of difficulty is that government acts in a dual role in dealing with universities. First, government is a set of operating agencies. They are mission-oriented. They have a job to get done. They will, in a sense, sell research to universities. They persuade people to take part in collaborative efforts. This is all to the good because it is the only way of getting their statutory jobs done. This approach is indispensable to effective accomplishment of missions.

On the other hand, government is at least the partial custodian of our national aspirations, and our national goals. Government as the sovereign state has an obviously deep stake in the preservation of a strong and free system of universities. Now if government accepts as policy that its actions in supporting research should at the same time ensure that universities remain strong islands of intellectual freedom in our society, its specifications will be influenced by the general policy. The approach that followed in an effort to ensure that universities remain strong is quite different from the one followed when the effort is to mount a pointed, direct attack upon problems of specific interest in the governmental operating agencies — Defense; Atomic Energy Commission; Agriculture; Health, Education and Welfare; and so forth. The mission-oriented approach has thus far been dominant, and the aims of government are not entirely congruent with those of the universities.

Another origin of difficulties between the universities and the Federal government is the fact that the government to date has concentrated upon research, rather than upon universities and colleges as such. Universities, of course, exist not only for inquiry but also for teaching and service. As a result the Federal pressure, generated largely by the availability of money, in effect distorts and throws out of balance the university structure and mission. Many universities have not been able, for a number of reasons, to exert countervailing pressure. The countervailing pressures arise essentially from a clear definition of university purpose, mission and limits, plus money and administrative capacity.

Actually, there has developed over the past few years an increasing degree of compatibility between the Federal programs and the functions of universities. This is because support for fellowships, various subventions for training and other educational activities, and support for construction of facilities usable

for teaching as well as research, has become much more extensive.

Another problem is that the bureaucrat is not like the academician and *vice versa*. Their ways of thinking are different. Their ways of acting are different. One of the most interesting developments over the past few years in government is the growth of a corps of people in government who are by and large drawn from the universities and have an understanding of what a university is about, an appreciation of what a university is for, what it takes for a university to survive and grow and be healthy. This personal relationship, I think, is fundamentally significant. As a matter of fact, it is probably one of the forces that is bringing us closer to the British system of support of universities. As Harold Dodds, the former president of Princeton pointed out, the university grant system of support in Great Britain is a quite flexible, informal arrangement. The government—in the person of the University Grants Committee —hands over without audit, without a specific budget, without debate in Parliament, very extensive sums for the general operation of British universities. Most remarkable from our point of view is the fact that the University Grants Committee is composed of representatives of the recipients of the grants. President Dodds is convinced that this system works only because of personal relationships among a small group of university people with a common background who, in Britain, are found both in government and in the universities. To a degree, that is happening in the United States, but the development is slow.

Another source of difficulty is that the research relationship between what is called the government and the universities is, in practice and in day-to-day operation, a relationship between the sub-bureaucrats and the sub-academicians. Numerous people from various agencies leave Washington for university campuses with blank checks in their pockets. They head for the department, and generally not for the departmental chairman. They head for a specific investigator. As a result, it is most difficult for a department head, a dean or a university president to influence adequately and properly what goes on in his university. He is in a sense undercut by his own faculty with the connivance of the people from Washington. Now this is a good way to get the government's business done, speaking of the government's business as an operating mission. But it is not a good system if one accepts a governmental responsibility to act in a way that fosters

strong universities. Moves have been taken to balance this system of direct dealing between Federal agencies and faculty members with more general research and training support, but the government, as a whole, has a long way to go.

Considering the foregoing catalog of problems, it is a wonder that things are not worse off than they actually are. As a matter of fact, the relationships between government and the universities are quite good. There is a long list of countervailing forces leading towards harmony, and these are in large part intertwined with the forces leading towards disharmony.

Take for example, the extreme diversity of rules and operating methods. The diversity may be somewhat annoying, but it is also an indispensable part of a very flexible and adaptable system. This flexibility is important to universities. Diversity also permits decisions to be made pragmatically, case by case and on a small scale. This would not be possible with a single, unified system. Another advantage of diversity is that it avoids the necessity of dealing directly with the ideological problem of what the total relationship of government and the universities should be. If we had had to face these basic ideological and political issues head on over the past few years, the confrontation probably would have wrecked the system.

As another example, direct dealing between the scientist in the university and the Federal representative has the fundamental advantage of establishing close personal relationships between the universities, the people in them, and the Federal government. There has been invented, in fact, a way of democratizing and decentralizing an operation which would otherwise be highly concentrated. Extensive participation of university scientists in the operation of the system, primarily through service on scientific advisory bodies, has created, in fact, a new relationship between the governmental administrator and the scientist. The advisory systems which have been set up, ranging from technical to high-policy groups, have brought university people into the making of decisions under a system which is, in fact, quite a remarkable political, scientific, administrative device whose implications have not yet been fully realized.

The maturation of the Federal support system has resulted in extension beyond research into construction of facilities and into training of people by a number of Federal agencies. This extension is beginning to ease the strain between universities and government. Nevertheless, the nation still has no general

Federal support of undergraduate education, or even of graduate education. I believe personally that this general support must come as a matter of declared national policy if there is to be a reasonable, stable, productive relationship between the government and the universities over the long run.

Federal support of research has, against the will of universities in many instances, forced better organization and better management upon universities. I believe that universities had better administer themselves better, or somebody else will administer some of their affairs for them. Improvement of management in a university has the same bad odor that administration has generally around any organization developed for creative people—universities, symphony orchestras, industrial laboratories, and so forth.

There is a recognition of mutual dependence between the universities and government which helps ease the strain. This recognition of mutual dependence on the part of the government and the universities is growing, and is a subterranean force which restrains both parties to the negotiations and tones down excesses. Both parties realize that they cannot get along without each other. This mutual dependence is not necessarily a partnership. It is, or should be, an arm-length bargaining process. To call it a partnership is, I think, sentimental nonsense. Both the universities and government are better off dealing as they are, as the universities and as government.

Looking broadly at the past and the present, one would find it hard to find an informed person who would hold that the net effect of extensive Federal research support has been bad. There is a very wide consensus that heavy Federal support of research has been extremely good for universities. It has improved the quality of teaching. It has improved the quality of graduate instruction as well as aided research.

Turning very briefly to the future, the dominant fact is that the Federal government and the universities will become increasingly involved. The relationship will become increasingly a total relationship rather than a partial one. That is, related increasingly to education and to general support of the universities as contrasted with research support. Government agencies will become increasingly involved with the general affairs of the universities partly through the new Office of Science and Technology that has been established in the White House. There is increasing recognition at the top, in government, that the

Federal-university relationship is an enduring one which is extremely important to the government, both in its operating capacity and in its larger role as a sovereign state.

The improvement of the Federal structure itself will tend to ease relationships, and make the universities-government relationship more responsive, even though the Federal structure is still weak.

The Federal research money will continue to flow to the universities. The universities will continue to be increasingly dependent on Federal funds.

In conclusion, the ability of the universities to establish within themselves countervailing forces against the pressure of Federal money and programs is a vitally important matter. Part of this countervailing force must be intellectual pressure. A clear definition of university aims and the ability to attain them is important. In addition, the countervailing pressures in terms of alternative sources of money, through endowment, through state appropriations and through private giving are also extremely important. The material and the intellectual countervailing forces from universities which are in being and which will become stronger seem to me to represent signs favorable to a decent resolution of these complex policy problems of Federal-university relations. But the ultimate solution must rest on a national consensus and policy which does not yet exist. That is, "What general aid should the Federal government provide to higher education and to students."

SUMMARY OF THE CONFERENCE ON ADMINISTRATION OF FEDERALLY SPONSORED UNIVERSITY RESEARCH

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Any attempt to summarize a subject so complex as Federal-university relations in the field of research must necessarily be impressionistic. The discussion, at the Atlanta Conference, of the various facets of this problem was sometimes rambling and some of the best discussion was in the informal sessions, during coffee breaks and meals. Naturally, I was exposed to only a small sampling of this discussion. Within this framework, I would like to present the following personal observations of what seemed to be important points that were either presented or developed during the Conference.

I will organize my remarks into two parts. First, research administration within the university and second, Federal-university relations in the research field. A discussion of each naturally flows into the other as any such division must be largely arbitrary.

There are several basic conditions of research administration in a university setting which separate it from other types of administration. Several of these were mentioned during the Conference.

First, a university is a collection of faculty members who, in the research field, are expected to and themselves expect to exert individual initiative in the development of research projects. The job of the university administrator is to encourage, guide, and nurture this initiative and, at the same time, get the teaching of the university done well, prevent gross abuses of individual faculty freedom, prevent major inequities in the treatment of individuals, and get the other work of the university accomplished.

The means for administration within the university are more indirect than direct. Through appointment and promotion and through the allocation of resources, the administrator influences the expression of faculty initiative; but he does not, except in a limited way, try directly to administer the activities of the

faculty. All of this is so obvious to the administrators in the university setting that it hardly needs repetition.

A large part of the resources for faculty research comes through grants and, as Dan Price has pointed out, the major directions the university will take in research are determined to a considerable degree from outside the university. For all of these reasons the administration of research in a university is a more complex process and change in it is accomplished more slowly than in most other organizations.

A second condition affecting the university is rapid change. Both Ken Little and Fred Cagle remarked on the tremendous growth of research support and the multitude of agencies and programs involved.

These two conditions, rapid change and a pattern of indirect administration which necessarily reacts slowly, have produced many problems which were presented and discussed during the conference. A few of them are:

(a) Unclear goals—many individual goals of faculty members and differing goals of faculty and administrators make the development of university research difficult.

(b) Personnel problems—these are reflected in problems of faculty compensation, problems of the growing group of non-faculty research workers, etc.

(c) Difficulty of administering some policies which people generally agree are desirable—for example, how can we assess the educational relevance of research? Its basic nature versus its application to practical problems? The balance between research and teaching? Its effects on undergraduate teaching? The balance between science and the humanities? All of these are important issues, but extremely difficult to assess in a way to help the administrator deal with them, and make meaningful decisions in specific cases.

Despite these problems, the university has no more difficulty in carrying on its program in the area of research than in teaching or service. Some of the needs generally recognized and discussed in the Conference were:

(a) Funds to enable the administrator to support activities in the university which advance its research goals. A limited amount of free money available to the research administrator and other university administrators would

give the university much more ability to influence the development of the research program.

(b) Another need which was not commented on extensively was for better-equipped university research administrators with a broader background of knowledge of Federal agencies and of the fields of knowledge in which research is conducted in the university.

(c) The need for better internal communication in the discussion of research issues among administrators, with boards of trustees, and with the faculty.

These seem to be some of the major points that were made about administration within the university. Let us turn now to the second aspect: university-Federal relations in the research field.

There has been a great deal of interest in a number of studies of Federal-university relations in the field of research, and a number of the Conference speakers have directed such studies. Policy which will govern Federal-university relations is gradually being evolved out of the many studies, conferences, and other interactions on this topic. The shape of this policy is still quite dim, because the relationships are many and complicated.

Fred Cagle made a major contribution to the description of these relationships by presenting an amoeba-like slide showing the inter-relations of Congress, the Federal agencies, university administrators, faculty members, educational organizations (such as the American Council and the Land Grant Association), scientific societies and the public.

It is quite clear that this amoeba-like creature needs a better nervous system. One proposal which has been made and which was discussed was the need for a Federal "brain"—a central point in the Federal hierarchy where the multitude of relationships between agencies and the universities could be mediated. Both the National Science Foundation and the Office of Education have in the past had some responsibility for this but have not been in a proper position in the government to carry out these responsibilities. It has seemed generally desirable that an office such as the Federal Office of Science and Technology in the Office of the President is going to be necessary to handle this part of the coordination.

The universities too will need to bring their interests into sharper focus and the American Council on Education is offering to serve as the medium by which this is accomplished.

It was also brought out in the discussion that congressmen [illegible] better understanding of the role of science in modern [illegible] the role of the university in the development of [illegible] is the possibility of regional assistance on this [illegible] much more effective to sit down with one's own co[illegible]scuss relations with the government in gen-era[illegible] telegrams about the overhead rate or about some ot[illegible]sis which is brewing in Congress. The regional agency might help bring universities and congressmen together.

The system of Federal-university relations is evolving. We do not have a true partnership between universities and the government. There has been some fuzzy talk about the partnership between the Federal government and the universities. Actually each has its own objectives and these overlap in part but are certainly not identical. At the same time, the old purchase of services concept on which the Federal project system of contracts was developed is changing into the much broader concept of support for science and universities. Up to this time, the scientists have been more involved in policy determination and execution in Federal agencies than have university administrators.

Another point which I believe is important is that universities in the future must make clearer decisions on what kinds of research they can accomplish. The universities will not be able to do all the research nor even all basic research. They must be more selective in accepting support only for those activities which are appropriate to a university and which they are best equipped to perform.

Finally I would like to suggest a few ways in which the Southern Regional Education Board might be helpful in the evolving relationships between the Federal agencies and the universities. First, I think they might supplement, with regional efforts, some of the national efforts to educate congressmen about the universities' role in science. Past experience in work with state legislatures indicates that the Board might be very helpful along these lines.

A second way in which the SREB could be helpful would be to continue its work with state legislatures and trustees on the evolving role of higher education in the Federal government. Many trustees and state legislators have a very limited appreciation of the role of the Federal government in the support of higher education. One of the first services that Dr. Cagle per-

formed for the SREB was to present to a group of trustees some information about the level of support for research in the universities. This was a revelation to many of them and is illustrative of the kind of things the Board has done successfully in the past and could continue in the future.

A third and closely related effort would be to assist with the education of industrial and business leaders who now feel that research is important but have a very limited appreciation in many instances of the universities' special contributions to the development of science and research.

Finally, the Board could also assist individual institutions at their request to evolve better means of dealing with the complex problems of internal research administration which they face and could generally assist in the continuing education of college administrators to some of these complexities.

This brief summary indicates what to me seem to be some of the important problems and issues that were discussed at the Atlanta Conference on Administration of Federally Sponsored Research. As in most such discussions there were more questions than answers, but it is through the process of discussion that policy both within the institution and between the institutions and the government can eventually be evolved.